

## Labor Market Analysis: 0430.00/Biotechnology and Biomedical Technology Stem Cell-Based Biomanufacturing

Associate of Science (A.S.) degree & Certificate requiring 16 or greater semester units  
Los Angeles Center of Excellence, February 2023

### Summary

<b>Program Endorsement:</b>	<b>Endorsed: All Criteria Met</b> <input checked="" type="checkbox"/>	<b>Endorsed: Some Criteria Met</b> <input type="checkbox"/>	<b>Not Endorsed</b> <input type="checkbox"/>
<b>Program Endorsement Criteria</b>			
<b>Supply Gap:</b>	Yes <input checked="" type="checkbox"/>		No <input type="checkbox"/>
<b>Living Wage: (Entry-Level, 25<sup>th</sup>)</b>	Yes <input checked="" type="checkbox"/>		No <input type="checkbox"/>
<b>Education:</b>	Yes <input checked="" type="checkbox"/>		No <input type="checkbox"/>
<b>Emerging Occupation(s)</b>			
	Yes <input type="checkbox"/>		No <input checked="" type="checkbox"/>

The Los Angeles Center of Excellence for Labor Market Research (LA COE) prepared this report to provide regional labor market supply and demand data related to two middle-skill occupations:

- **Biological Technicians (19-4021)** Assist biological and medical scientists. Set up, operate, and maintain laboratory instruments and equipment, monitor experiments, collect data and samples, make observations, and calculate and record results. May analyze organic substances, such as blood, food, and drugs.<sup>1</sup>
- **Clinical Laboratory Technologists and Technicians (29-2018)** This occupation includes the 2018 SOC occupations: Medical and Clinical Laboratory Technologists (29-2011) and Medical and Clinical Laboratory Technicians (29-2012).<sup>2</sup>
  - **Medical and Clinical Laboratory Technologists (29-2011)** Perform complex medical laboratory tests for diagnosis, treatment, and prevention of disease. May train or supervise staff.
  - **Medical and Clinical Laboratory Technicians (29-2012)** Perform routine medical laboratory tests for the diagnosis, treatment, and prevention of disease. May work under the supervision of a medical technologist.

Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.<sup>3</sup> Although the occupations in this report typically require a bachelor's degree,

<sup>1</sup> [Biological Technicians : Occupational Outlook Handbook : U.S. Bureau of Labor Statistics \(bls.gov\)](https://www.bls.gov/occupational-outlook-handbook/)

<sup>2</sup> [Clinical Laboratory Technologists and Technicians : Occupational Outlook Handbook : U.S. Bureau of Labor Statistics \(bls.gov\)](https://www.bls.gov/occupational-outlook-handbook/)

<sup>3</sup> The COE classifies middle-skill jobs as the following:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or

they are considered middle-skill because approximately one-third of workers in the field have completed some college or an associate degree. This report is intended to help determine whether there is demand in the local labor market that is not being met by the supply from community college programs that align with the relevant occupations.

Based on the available data, there appears to be a supply gap for these two biomedical technician occupations in the region. Furthermore, the majority of annual openings in LA County have entry-level wages that exceed the self-sufficiency standard wage, and more than one-third of current workers in the field have completed some college or an associate degree. **Therefore, due to all the criteria being met, the LA COE endorses this proposed program.** Detailed reasons include:

#### **Demand:**

- **Supply Gap Criteria** – Over the next five years, **1,297 jobs are projected to be available annually** in the region due to new job growth and replacements, **which is more than the three-year average of 233 awards conferred** by educational institutions in the region.
  - Over the past 12 months, there were **412 online job postings related to the occupations in this report that also listed one of the following skills: gene therapy, cell therapy and/or immunology.** The highest number of job postings were for research associates, laboratory assistants, medical laboratory technicians, laboratory technicians, and immunologists.
- **Living Wage Criteria** – Within Los Angeles County, the majority (78%) of annual job openings for these biomedical technician occupations have **entry-level wages above the self-sufficiency standard hourly wage** (\$18.10/hour).<sup>4</sup>
- **Educational Criteria** – The Bureau of Labor Statistics (BLS) lists a **bachelor's degree** as the typical entry-level education for both occupations in this report.
  - However, the national-level educational attainment data indicates **between 37% and 40% of workers in the field have completed some college or an associate degree.**

#### **Supply:**

- There are **11 community colleges** in the greater LA/OC region that issue awards related to biomedical occupations, conferring an average of **174 awards annually** between 2018 and 2021.
- Between 2017 and 2020, there was an average of **59 awards conferred annually** in related training programs by non-community college institutions throughout the greater LA/OC region.

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- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

<sup>4</sup> Self-Sufficiency Standard wage data was pulled from The Self-Sufficiency Standard Tool for California. For more information, visit: <http://selfsufficiencystandard.org/california>.

## Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for these middle-skill biomedical occupations. In the greater Los Angeles/Orange County region, the number of jobs related to these occupations is projected to increase by 12% through 2026. There will be nearly 1,300 job openings per year through 2026 due to job growth and replacements.

**Exhibit 1: Occupational demand in Los Angeles and Orange Counties<sup>5</sup>**

Geography	2021 Jobs	2026 Jobs	2021-2026 Change	2021-2026 % Change	Annual Openings
Los Angeles	8,724	9,557	833	10%	868
Orange	3,577	4,251	674	19%	428
<b>Total</b>	<b>12,300</b>	<b>13,808</b>	<b>1,507</b>	<b>12%</b>	<b>1,297</b>

## Wages

The labor market endorsement in this report considers the entry-level hourly wages for these middle-skill biomedical occupations in Los Angeles County as they relate to the county's self-sufficiency standard wage. Orange County wages are included below in order to provide a complete analysis of the greater LA/OC region. Detailed wage information, by county, is included in Appendix A.

**Los Angeles County**—The majority (78%) of annual openings for middle-skill biomedical occupations have entry-level wages above the self-sufficiency standard wage for one adult (\$18.10 in Los Angeles County). Typical entry-level hourly wages are in a range between \$17.27 and \$22.19. *Clinical laboratory technologists and technicians* have entry-level wages above the county's self-sufficiency standard: \$22.19. Experienced workers can expect to earn wages between \$29.02 and \$37.93, which are higher than the self-sufficiency standard.

**Exhibit 2: Hourly Earnings for Occupations in LA County**

Occupation	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)
Biological Technicians (19-4021)	\$17.27	\$22.40	\$29.02
Clinical Laboratory Technologists and Technicians (29-2018)	\$22.19	\$28.62	\$37.93

<sup>5</sup> Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

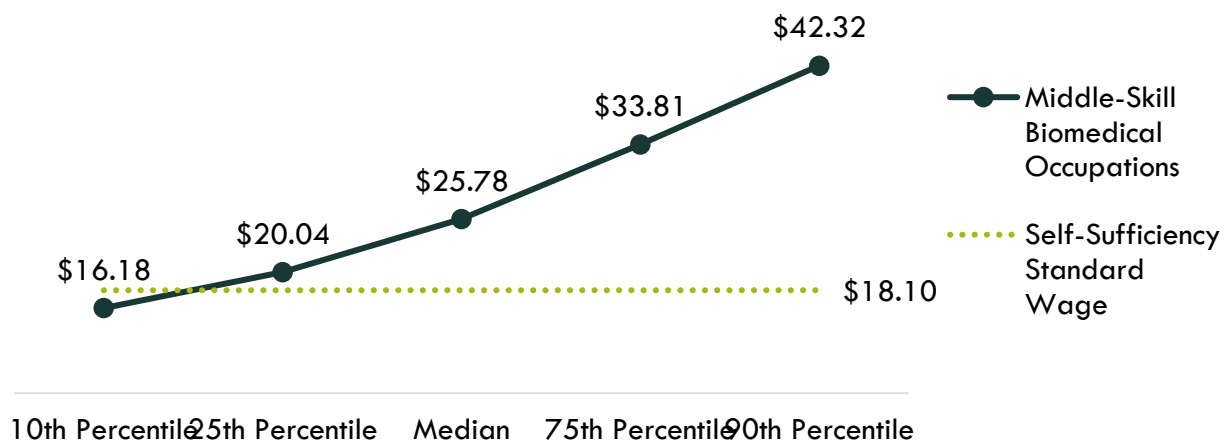
**Orange County**—The majority (84%) of annual openings for these middle-skill biomedical occupations have entry-level wages above the self-sufficiency standard wage for one adult (\$20.63 in Orange County). Typical entry-level hourly wages are in a range between \$18.18 and \$23.25. *Clinical laboratory technologists and technicians* have entry-level wages above the county’s self-sufficiency standard: \$23.25. Experienced workers can expect to earn wages between \$29.87 and \$39.39, which are higher than the self-sufficiency standard.

**Exhibit 3: Hourly Earnings for Occupations in Orange County**

Occupation	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)
Biological Technicians (19-4021)	\$18.18	\$23.06	\$29.87
Clinical Laboratory Technologists and Technicians (29-2018)	\$23.25	\$29.87	\$39.39

On average, the entry-level earnings for the occupations in this report are \$20.04; this is above the living wage for one single adult in Los Angeles County (\$18.10). Exhibit 4 shows the average wage for the occupations in this report, from entry-level to experienced workers.

**Exhibit 4: Average Hourly Earnings for Middle-Skill Biomedical Occupations in LA/OC**



**Job Postings**

Over the past 12 months, there were 412 online job postings related to the occupations in this report that also listed one of the following skills: **gene therapy, cell therapy and/or immunology**. Exhibit 5 displays the number of job postings by occupation. The majority of job postings (63%) were for *clinical laboratory technologists and technicians*, followed by *biological technicians* (37%). The highest number of job postings were for research associates, laboratory assistants, medical laboratory technicians, laboratory technicians, and immunologists. The top skills were immunology, microbiology, biology, chemistry, and cell cultures. The top three employers, by number of job postings, in the region were Prime Healthcare Services, Cedars-Sinai, and Gilead Sciences.

### Exhibit 5: Job postings by occupation (last 12 months)

Clinical Laboratory Technologists and Technicians	259
Biological Technicians	153

#### Educational Attainment

The Bureau of Labor Statistics (BLS) lists a bachelor’s degree as the typical entry-level education for both occupations in this report. However, the national-level educational attainment data indicates between 37% and 40% of workers in the field have completed some college or an associate degree. Of the 84% of related job postings listing a minimum education requirement in the greater Los Angeles/Orange County region, 35% (120) requested high school or vocational training, 12% (42) requested an associate degree, and 53% (185) requested a bachelor’s degree.

#### Educational Supply

**Community College Supply**—Exhibit 6 shows the annual and three-year average number of awards conferred by community colleges in programs that have historically trained for the occupations of interest. The colleges with the most completions in the region are LA Mission, Pasadena, and Saddleback.

**Exhibit 6: Regional community college awards (certificates and degrees), 2018-2021**

TOP	Program	College	2018-19 Awards	2019-20 Awards	2020-21 Awards	3-Year Average
0430.00	Biotechnology and Biomedical Technology	Citrus	19	8	5	11
		East LA	-	5	7	4
		LA Mission	21	37	17	25
		LA Trade-Tech	2	7	6	5
		Pasadena	18	24	32	25
		<b>LA Subtotal</b>	<b>60</b>	<b>81</b>	<b>67</b>	<b>69</b>
		Fullerton	18	18	13	16
		Irvine	25	33	14	24
		Santa Ana	11	10	5	9
		Santiago Canyon	11	8	9	9
		<b>OC Subtotal</b>	<b>65</b>	<b>69</b>	<b>41</b>	<b>58</b>
<b>Supply Subtotal/Average</b>			<b>125</b>	<b>150</b>	<b>108</b>	<b>128</b>
0955.00	Laboratory Science Technology	Mt San Antonio	2	1	5	3
		<b>LA Subtotal</b>	<b>2</b>	<b>1</b>	<b>5</b>	<b>3</b>
<b>Supply Subtotal/Average</b>			<b>2</b>	<b>1</b>	<b>5</b>	<b>3</b>

TOP	Program	College	2018-19 Awards	2019-20 Awards	2020-21 Awards	3-Year Average
1205.00	Medical Laboratory Technology	Mt San Antonio	19	11	26	19
		<b>LA Subtotal</b>	<b>19</b>	<b>11</b>	<b>26</b>	<b>19</b>
		Saddleback	18	29	27	25
		<b>OC Subtotal</b>	<b>18</b>	<b>29</b>	<b>27</b>	<b>25</b>
<b>Supply Subtotal/Average</b>			<b>37</b>	<b>40</b>	<b>53</b>	<b>43</b>
<b>Supply Total/Average</b>			<b>164</b>	<b>191</b>	<b>166</b>	<b>174</b>

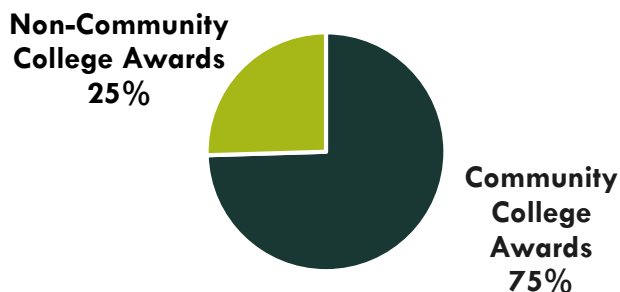
**Non-Community College Supply**—For a comprehensive regional supply analysis, it is important to consider the supply from other institutions in the region that provide training programs for biomedical technician occupations. Exhibit 7 shows the annual and three-year average number of awards conferred by these institutions in relevant programs. Due to different data collection periods, the most recent three-year period of available data is from 2017 to 2020. Between 2017 and 2020, non-community college institutions in the region conferred an average of 59 awards.

**Exhibit 7: Regional non-community college awards, 2017-2020**

CIP	Program	Institution	2017-18 Awards	2018-19 Awards	2019-20 Awards	3-Year Average
15.0401	Biomedical Technology/ Technician	Southern California Institute of Technology	62	63	46	57
26.1104	Computational Biology	University of Southern California	-	-	7	2
<b>Supply Total/Average</b>			<b>62</b>	<b>63</b>	<b>53</b>	<b>59</b>

Exhibit 8 shows the proportion of community college awards conferred in LA/OC compared to the number of non-community college awards for the programs in this report. Three out of four awards conferred in these programs are awarded by community colleges in the LA/OC region.

**Exhibit 8: Community College Awards Compared to Non-Community College Awards in LA/OC Region, 3-Year Average**



**Appendix A: Occupational demand and wage data by county**

**Exhibit 9. Los Angeles County**

Occupation (SOC)	2021 Jobs	2026 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)
Biological Technicians (19-4021)	1,160	1,332	172	15%	195	\$17.27	\$22.40	\$29.02
Clinical Laboratory Technologists and Technicians (29-2018)	7,564	8,225	661	9%	673	\$22.19	\$28.62	\$37.93
<b>Total</b>	<b>8,724</b>	<b>9,557</b>	<b>833</b>	<b>10%</b>	<b>868</b>	-	-	-

**Exhibit 10. Orange County**

Occupation (SOC)	2021 Jobs	2026 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)
Biological Technicians (19-4021)	407	467	61	15%	68	\$18.18	\$23.06	\$29.87
Clinical Laboratory Technologists and Technicians (29-2018)	3,170	3,783	613	19%	360	\$23.25	\$29.87	\$39.39
<b>Total</b>	<b>3,577</b>	<b>4,251</b>	<b>674</b>	<b>19%</b>	<b>428</b>	-	-	-

**Exhibit 11. Los Angeles and Orange Counties**

Occupation (SOC)	2021 Jobs	2026 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Typical Entry-Level Education
Biological Technicians (19-4021)	1,566	1,799	233	15%	264	Bachelor's degree
Clinical Laboratory Technologists and Technicians (29-2018)	10,734	12,009	1,274	12%	1,033	Bachelor's degree
<b>Total</b>	<b>12,300</b>	<b>13,808</b>	<b>1,507</b>	<b>12%</b>	<b>1,297</b>	-

## Appendix B: Sources

- O\*NET Online
- Lightcast (formerly Emsi)
- Bureau of Labor Statistics (BLS)
- California Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- Self-Sufficiency Standard at the Center for Women's Welfare, University of Washington
- Chancellor's Office Curriculum Inventory (COCI 2.0)

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